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your method of philosophizing, which proceeds upon actual observation, makes a collection of facts, and concludes no farther than those facts will warrant. In my present circumstances, that mode of studying the nature of this globe is out of my power, and therefore I have permitted myself to wander a little in the wilds of fancy. With greate steem I have the honour to be, &c.

P. S. I have heard that chemists can by their art decompose stone and wood, extracting a considerable quantity of water from the one, and air from the other. It seems natural to conclude from this, that water and air were ingredients in their original composition. For men cannot make new matter of any kind. In the same manner may we not suppose, that when we consume combustibles of all kinds, and produce heat or light, we do not create that heat or light; but only decompose a substance which received it originally as a part of its composition? Heat may thus be considered as originally in a fluid state, but, attracted by organized bodies in their growth, becomes a part of the solid. Besides this, I can conceive that in the first assemblage of the particles of which this earth is composed each brought its portion of the loose heat that had been connected with it, and the whole when pressed together produced the internal fire which still subsists.

N^o. II.

A new and curious Theory of Light and Heat ; in a letter from Dr. B. Franklin to David Rittenhouse, Esq.

Read June 20, 1788. **U**NIVERSAL space, as far as we know of it, seems to be filled with a subtil fluid, whose motion, or vibration, is called light. This

This fluid may possibly be the same with that which being attracted by and entering into other more solid matter, dilates the substance, by separating the constituent particles and so rendering some solids fluid, and maintaining the fluidity of others; of which fluid when our bodies are totally deprived, they are said to be frozen; when they have a proper quantity, they are in health, and fit to perform all their functions; it is then called natural heat; when too much, it is called fever; and when forced into the body in too great a quantity from without, it gives pain by separating and destroying the flesh, and is then called burning; and the fluid so entering and acting is called fire.

While organized bodies, animal or vegetable, are augmenting in growth, or are supplying their continual waste, is not this done by attracting and consolidating this fluid, called fire, so as to form of it a part of their substance; and is it not a separation of the parts of such substance, which dissolving its solid state, sets that subtil fluid at liberty, when it again makes its appearance as fire?

For the power of man relative to matter, seems limited to the separating or mixing the various kinds of it, or changing its form and appearance by different compositions of it; but does not extend to the making or creating of new matter, or annihilating the old: thus if fire be an original element or kind of matter, its quantity is fixed and permanent in the universe. We cannot destroy any part of it, or make addition to it. We can only separate it from that which confines it, and so set it at liberty, as when we put wood in a situation to be burnt; or transfer it from one solid to another, as when we make lime by burning stone, a part of the fire dislodged from the fuel being left in the stone. May not this fluid when at liberty be capable of penetrating and entering into all bodies, organized or not: quitting easily in totality those not organized, and
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quitting easily in part those which are ; the part assumed and fixed remaining till the body is dissolved ?

Is it not this fluid which keeps asunder the particles of air, permitting them to approach, or separating them more in proportion as its quantity is diminished or augmented ?

Is it not the greater gravity of the particles of air, which forces the particles of this fluid to mount with the matters to which it is attached as smoke or vapour ?

Does it not seem to have a great affinity with water ; since it will quit a solid to unite with that fluid, and go off with it in vapour ; leaving the solid cold to the touch, and the degree measurable by the thermometer ?

The vapour rises attached to this fluid, but at a certain height they separate, and the vapour descends in rain retaining but little of it, in snow or hail less. What becomes of that fluid ? Does it rise above our atmosphere, and mix with the universal mass of the same kind ?

Or does a spherical shell or stratum of it, denser, as less mixed with air, attracted by this globe, and repelled or pushed up only to a certain height from its surface by the greater weight of air, remain there surrounding the globe and proceeding with it round the sun ?

In such case, as there may be a continuity or communication of this fluid through the air quite down to the earth, is it not by the vibrations given to it by the sun that light appears to us ; and may it not be, that every one of the infinitely small vibrations, striking common matter with a certain force, enters its substance, is held there by attraction, and augmented by succeeding vibrations, till the matter has received as much as their force can drive into it ?

Is it not thus that the surface of this globe is continually heated by such repeated vibrations in the day, and cooled by the escape of the heat when those vibrations are discontinued in the night, or intercepted and reflected by clouds ?

Is it not thus that fire is amassed and makes the greatest part of the substance of combustible bodies ?

Perhaps when this globe was first formed and its original particles took their place at certain distances from the centre in proportion to their greater or less gravity, the fluid fire attracted towards that centre might in great part be obliged, as lightest, to take place above the rest, and thus form the sphere of fire above supposed; which would afterwards be continually diminishing by the substance it afforded to organized bodies, and the quantity restored to it again by the burning or other separating of the parts of those bodies ?

Is not the natural heat of animals thus produced by separating in digestion the parts of food, and setting their fire at liberty ?

Is it not this sphere of fire which kindles the wandering globes that sometimes pass through it in our course round the sun, have their surface kindled by it, and burst when their included air is greatly rarefied by the heat on their burning surface ?

May it not have been from such considerations that the ancient philosophers supposed a sphere of fire to exist above the air of our atmosphere ?

N^o. III.

Description of the process to be observed in making large sheets of paper in the Chinese manner, with one smooth surface. Communicated by Dr. B. FRANKLIN.

Read June 20, 1788. **I**N Europe to have a large surface of paper connected together and smooth on one side, the following operations are performed.

1. A number of small sheets are to be made separately.
2. These